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## NOTICES

### PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

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### EAORC NEWS – Scitsiugnil Press

Just a reminder that, if you want to publish something free-to download, free-to-read, and free-to-publish, Scitsiugnil Press is available. Your publication gets an ISBN, which means it is indexed in libraries Worldwide.

<http://martinedwardes.me.uk/scitsiugnil/>

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### ACADEMIA.EDU – Approaches for Understanding Flake Production in the African Acheulean

*In Paleo Anthropology 2011, 376-389. (2011).*

**CHRISTIAN A. TRYON & RICHARD POTTS – Approaches for Understanding Flake Production in the African Acheulean**

Acheulean lithic technology is comprised of more than handaxes or other large cutting tools. Artifact assemblages from Member 11’ of the Olorgesailie Formation, Kenya, form the basis of our detailed examination of the flake and core component of an Acheulean behavioral system preserved in sediments dating to ~662–625 ka. We contrast what we consider

descriptive and explanatory methods of lithic analysis currently in use among researchers studying the African Early Stone Age, and explore here an 'industry-free,' attribute-based analysis for the study of raw material economy. For sites from Member 11' and Member 1 (~990 ka) of the Olorgesailie Formation, we compared the size of transported artifacts, the reduction intensity of flaked pieces, and flake utility (estimated by the ratio of flake cutting edge: thickness). Our results suggest a positive relationship between raw material economy and inferred paleoenvironmental structure, and demonstrate that the analysis of flakes and cores is an important complement to the study of handaxes, cleavers, and other characteristic Acheulean artifacts.

[https://www.academia.edu/6443151/Approaches\\_for\\_Understanding\\_Flake\\_Production\\_in\\_the\\_African\\_Acheulean](https://www.academia.edu/6443151/Approaches_for_Understanding_Flake_Production_in_the_African_Acheulean)

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## ACADEMIA.EDU – Exploring the Indigenous Face of Europe

*Creative Commons document (2022).*

### **ROSLYN M. FRANK – Exploring the Indigenous Face of Europe: Rethinking Fairytales, the Pilgrimage to Santiago de Compostela and Glass Mountain before Cinderella**

This monograph examines the way two sets of wide-spread European folktales became incorporated into the storytelling traditions of Europeans. The stories themselves will be compared and treated as reservoirs of orally transmitted popular beliefs and traditions that are no longer readily accessible to a modern audience. It will be shown that the tales themselves have acted as vehicles for transmitting an earlier animist worldview from one generation to the next, albeit with modifications. When viewed in the longue durée, certain repetitive elements found in the tales will reveal their ethnographic value and allow us to reconstruct, always tentatively, the animist ontological framing that contributed to their creation. After carefully exploring the interpretive framework that characterized the tales in times past, a framework shared by storytellers and their audiences alike, what will come into focus is a worldview unfamiliar to most Europeans, but well known to Native Americans and Indigenous groups where bear ceremonialism has been or still is practiced and whose traditional narratives incorporate the belief that bears were ancestors and therefore kin.

[https://www.academia.edu/79329538/Exploring\\_the\\_Indigenous\\_Face\\_of\\_Europe\\_Rethinking\\_Fairytales\\_the\\_Pilgrimage\\_to\\_Santiago\\_de\\_Compostela\\_and\\_Glass\\_Mountain\\_before\\_Cinderella](https://www.academia.edu/79329538/Exploring_the_Indigenous_Face_of_Europe_Rethinking_Fairytales_the_Pilgrimage_to_Santiago_de_Compostela_and_Glass_Mountain_before_Cinderella)

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## RESEARCHGATE – From Nut-Cracking and Stone-Tool Making to Bird Nests and Language

*Michael A. Arbib, Dorothy M. Fragaszy, Susan D. Healy & Dietrich Stout (December 21, 2021)*

*Final report of the ABLE (Action, Brain, Language, Evolution) mini-workshop on “Construction, Tools and Language” held at Emory University, Atlanta, November 2019 (2021).*

### **MICHAEL A. ARBIB et al – Tooling and Construction: From Nut-Cracking and Stone-Tool Making to Bird Nests and Language**

This article is the final report of the ABLE (Action, Brain, Language, Evolution) mini-workshop on “Construction, Tools and Language” held at Emory University, Atlanta, November 2019. The paper approaches tool use, construction and language within a new framework for comparative biology and psychology studies that builds on neuroethological studies of action-oriented perception in relation to human manual skills, preconditions and postconditions for action, tooling, distalization in space (distalization of the end effector) and time (current actions may serve distal goals), and a view of affordances that incorporates elements of Gibson’s ecological psychology, but in a way that explores their possible titration against cognitive processes. The diverse applicability of this framework is exemplified by analysis of nut cracking by monkeys, of Oldowan and Acheulean stone tool making as examples of subtractive construction, and of nest-building by birds and construction of hafted tools as examples of additive construction. Language is assessed as a process of mental construction and comprehension and related to manual skills by the technological pedagogy hypothesis and the mirror system hypothesis.

[https://www.researchgate.net/publication/360577578\\_Construction\\_Tools\\_and\\_Language\\_Final\\_Report\\_December\\_21\\_2021](https://www.researchgate.net/publication/360577578_Construction_Tools_and_Language_Final_Report_December_21_2021)

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## NEWS

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### **BREAKING SCIENCE – New Fossil Discovery Suggests Denisovans Lived in Laos 164,000-131,000 Years Ago**

Paleoanthropologists have found a permanent lower molar of a young, likely female, hominin individual at the Tam Ngu Hao 2 limestone cave in the Annamite Mountains, Laos. The close morphological affinities with the Xiahe specimen from China indicate that the specimen belongs to the same taxon and most likely represents a Denisovan.

<http://www.sci-news.com/archaeology/laos-denisovan-10814.html>

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### **BREAKING SCIENCE – 13,000-Year-Old Red Ocher Quarry Found in Wyoming**

Intact artifacts and features found at the Powars II site, a red ocher (also known as hematite) quarry located in the foothills of the southern Rocky Mountains in Wyoming, demonstrate unequivocal evidence for red ocher quarrying by Paleoindians beginning 12,840 to 12,505 years ago, thus establishing Powars II as the oldest red ocher quarry identified in the Americas.

<http://www.sci-news.com/archaeology/powars-ii-red-ocher-quarry-10825.html>

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## NATURE BRIEFING – Tooth suggests Denisovans roamed Asia

A fossilized tooth unearthed in a cave in northern Laos might have belonged to a young Denisovan girl who died between 164,000 and 131,000 years ago. If confirmed, it would be the first fossil evidence that Denisovans — an extinct hominin species that co-existed with Neanderthals and modern humans — lived in southeast Asia. The molar would be only the second Denisovan fossil found outside Siberia, but millions of people with Asian, Oceanian or Pacific Islander ancestry carry traces of Denisovan DNA.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=9f8fb81f72&e=1db4b9a19b>

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## NATURE BRIEFING – Videos reveal how Asian elephants mourn

Videos uploaded to YouTube have given fresh insight into how Asian elephants (*Elephas maximus*) respond to death. Researchers used the videos to describe, sometimes for the first time, behaviours that had been known only anecdotally. These included what seems to be keeping vigil over the body of a peer, trumpeting or roaring, and females carrying deceased calves. “These rare and extremely important natural-history observations suggest that an awareness of loss is present in elephants,” says elephant researcher Phyllis Lee.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=c1a1aa445d&e=1db4b9a19b>

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## SAPIENS – What the Vai Script Reveals About the Evolution of Writing

In 1833, in a region of West Africa that would soon become the independent nation of Liberia, a man named Momulu Duwalu Bukele dreamed of writing symbols to represent his native language, Vai. When he awoke, he and other family members set about making his dream a reality—giving birth to the Vai language’s first written alphabet. Since then, the Vai writing system has evolved, as all languages do. However, unlike much earlier writing systems—many of which have been lost to the historical record—there’s a well-documented archive of the Vai script’s evolution. Using computational tools to analyze changes in the 200 symbols of the Vai language, linguistic anthropologist Piers Kelly and his colleagues have been able to develop a clearer idea of how and why writing has evolved across human societies more broadly.

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=7ec23ad672&e=dc0eff6180>

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## SCIAM NEWS – How the Brain ‘Constructs’ the Outside World

Neural activity probes your physical surroundings to select just the information needed to survive and flourish.

<https://www.scientificamerican.com/article/how-the-brain-constructs-the-outside-world/>

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## SCIAM NEWS – “Birdbrain” Turns from Insult to Praise

Some avian species use tools and can recognize themselves in the mirror. How do tiny brains pull off such big feats?

<https://www.scientificamerican.com/article/birdbrain-turns-from-insult-to-praise/>

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## SCIENCE DAILY – Both nature and nurture contribute to signatures of socioeconomic status in the brain

Researchers found that a person's genetics and the environment in which they live contribute to how socioeconomic status shapes the architecture of the brain.

<https://www.sciencedaily.com/releases/2022/05/220518140703.htm>

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## SCIENCE DAILY – Ecologists propose new tools to assess sex and power among wild animals

In the wild, it might seem like male animals run the show. But researchers have laid a new framework to assess power distribution between the sexes, and its application has shown that in some animal species, females rule the roost and their paths to power look very different from that of their male counterparts’.

<https://www.sciencedaily.com/releases/2022/05/220518113355.htm>

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## SCIENCE DAILY – Research confirms eastern Wyoming Paleoindian site as Americas' oldest mine

The Powars II site at Sunrise in Wyoming’s Platte County the oldest documented red ocher mine -- and likely the oldest known mine of any sort -- in all of North and South America.

<https://www.sciencedaily.com/releases/2022/05/220519125740.htm>

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## SCIENCE DAILY – Watch dolphins line up to self-medicate skin ailments at coral 'clinics'

If a human comes down with a rash, they might go to the doctor and come away with some ointment to put on it. Indo-Pacific bottlenose dolphins get skin conditions, too, but they come about their medication by queuing up nose-to-tail to rub themselves against corals. Researchers now show that these corals have medicinal properties, suggesting that the dolphins are using the marine invertebrates to medicate skin conditions.

<https://www.sciencedaily.com/releases/2022/05/220519115317.htm>

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## SCIENCE DAILY – Prehistoric feces reveal parasites from feasting at Stonehenge

Study of ancient faeces found at a settlement thought to have housed builders of the famous stone monument suggests that parasites got consumed via badly-cooked cow offal during epic winter feasts.

<https://www.sciencedaily.com/releases/2022/05/220519204535.htm>

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## SCIENCE NEWS – This unusual tooth is the first fossil evidence of Denisovans in Southeast Asia

New find supports a wide range for this ancient human ancestor.

<https://www.science.org/content/article/unusual-tooth-first-fossil-evidence-denisovans-southeast-asia>

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## SCIENCE NEWS – These dolphins might be self-medicating

Animals rub against antibacterial corals and sponges, possibly to ward off skin infections.

<https://www.science.org/content/article/these-dolphins-might-be-self-medicating>

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## SOCIETY FOR SCIENCE – A Denisovan girl's fossil tooth may have been unearthed in Laos

A molar adds to suspicions that mysterious hominids called Denisovans inhabited Southeast Asia's tropical forests.

<https://www.sciencenews.org/article/denisovan-girl-fossil-tooth-hominid-laos-anthropology>

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## SOCIETY FOR SCIENCE – A 'mystery monkey' in Borneo may be a rare hybrid. That has scientists worried

Severe habitat fragmentation caused by expanding palm oil plantations may have driven two primate species to mate that wouldn't have otherwise.

<https://www.sciencenews.org/article/mystery-monkey-hybrid-borneo-habitat>

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## SOCIETY FOR SCIENCE – Prehistoric people may have used light from fires to create dynamic art

When brought near flickering flames, prehistoric stone engravings of animals seem to move, experiments with replicas and virtual reality show.

<https://www.sciencenews.org/article/prehistoric-people-fire-light-dynamic-art>

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## PUBLICATIONS

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### American Journal of Biological Anthropology

#### PAPERS

#### **ZACHARY COFRAN et al with LEE R. BERGER – The immature Homo naledi ilium from the Lesedi Chamber, Rising Star Cave, South Africa**

We compared the Lesedi ilium to remains from the Dinaledi Chamber, other South African hominin fossils, and an ontogenetic series of human ilia. We used the Dinaledi adults as a guide for reconstructing the Lesedi ilium. To assess development of the Lesedi ilium, we compared immature/mature proportional ilium height for fossils and humans. We used 3D geometric morphometrics (GMs) to examine size and shape variation among this sample.

The Lesedi ilium showed incipient development of features expressed in adult H. naledi ilia. The proportional height of the Lesedi ilium was within the range of human juveniles between 4–11 years of age. GM analyses showed that the Lesedi ilium had an iliac blade shape similar to those of australopiths and an expanded auricular surface more similar to humans.

The reconstructed Lesedi specimen represents the best preserved ilium of H. naledi, confirming the australopith-like iliac blade morphology first hypothesized in adult specimens, and establishing that this anatomy was present early in this species' ontogeny. In contrast to australopiths, the Lesedi ilium displays an enlarged sacroiliac joint, the significance of which requires further investigation.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24522>

#### **ANGELA M. TARAVELLA OILL et al – Genomic analysis reveals geography rather than culture as the predominant factor shaping genetic variation in northern Kenyan human populations**

The aim of this study was to characterize the genetic relationships within and among four neighboring ethnolinguistic groups in northern Kenya in light of cultural relationships to understand the extent to which geography and culture shape patterns of genetic variation.

We collected DNA and demographic information pertaining to aspects of social identity and heritage from 572 individuals across the Turkana, Samburu, Waso Borana, and Rendille of northern Kenya. We sampled individuals across a total of nine clans from these four groups and, additionally, three territorial sections within the Turkana and successfully genotyped 376 individuals.

Here we report that geography predominately shapes genetic variation within and among human groups in northern Kenya. We observed a clinal pattern of genetic variation that mirrors the overall geographic distribution of the individuals we sampled. We also found relatively higher rates of intermarriage between the Rendille and Samburu and evidence of gene flow between them that reflect these higher rates of intermarriage. Among the Turkana, we observed strong recent genetic

substructuring based on territorial section affiliation. Within ethnolinguistic groups, we found that Y chromosome haplotypes do not consistently cluster by natal clan affiliation. Finally, we found that sampled populations that are geographically closer have lower genetic differentiation, and that cultural similarity does not predict genetic similarity as a whole across these northern Kenyan populations.

Overall, the results from this study highlight the importance of geography, even on a local geographic scale, in shaping observed patterns of genetic variation in human populations.

*{I believe this is probably an important paper, but the conclusions seem rather arbitrary. Is "Relatively higher rates of intermarriage between the Rendille and Samburu and evidence of gene flow between them that reflect these higher rates of intermarriage" really a geographic effect and not a cultural effect?}*

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24521>

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## Behaviour

### PAPERS

#### **KRISTIN HAVERCAMP et al with VOLKER SOMMER – Spontaneous nocturnal erections and masturbation in captive male chimpanzees (*Pan troglodytes*)**

Nocturnal penile tumescence (NPT) has been reported for males of only a few mammalian species, including humans, albeit this scarcity might be an artefact of the difficulty of documenting it. We investigated NPT in 12 adult male chimpanzees living in an all-male group at Kumamoto Sanctuary, Japan. Recorded non-invasively with infrared video cameras across 72 nights (6 per individual), we observed NPT in two thirds of the individuals (8/12), with N=46 events in total. More than three quarters occurred during a transition from sleep to wakefulness, suggesting NPT may be associated with rapid eye movement sleep, similar to humans. Masturbation occurred in conjunction with NPT, including the likely consumption of ejaculate, in 4–6 individuals. While detailing nocturnal erections in chimpanzees may help us to better understand this robust physiological phenomenon in humans, further comparative research is necessary to reconstruct its phylogenetic history. At present, our findings support hypothetical functional explanations such as the facilitation of nocturnal emissions in order to increase ejaculate quality or an increase in tissue oxygenation to prevent erectile dysfunction.

<https://brill.com/view/journals/beh/aop/article-10.1163-1568539X-bja10166/article-10.1163-1568539X-bja10166.xml>

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## Current Biology

### PAPERS

#### **Z. YAN WANG et al – Isolation disrupts social interactions and destabilizes brain development in bumblebees**

Social isolation, particularly in early life, leads to deleterious physiological and behavioral outcomes. Here, we leverage new high-throughput tools to comprehensively investigate the impact of isolation in the bumblebee, *Bombus impatiens*, from behavioral, molecular, and neuroanatomical perspectives. We reared newly emerged bumblebees in complete isolation, in small groups, or in their natal colony, and then analyzed their behaviors while alone or paired with another bee. We find that when alone, individuals of each rearing condition show distinct behavioral signatures. When paired with a conspecific, bees reared in small groups or in the natal colony express similar behavioral profiles. Isolated bees, however, showed increased social interactions. To identify the neurobiological correlates of these differences, we quantified brain gene expression and measured the volumes of key brain regions for a subset of individuals from each rearing condition. Overall, we find that isolation increases social interactions and disrupts gene expression and brain development. Limited social experience in small groups is sufficient to preserve typical patterns of brain development and social behavior.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00702-3](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00702-3)

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## eLife

### NEWS

#### **Does male dimorphism matter?**

A new analysis examines whether masculine traits impact reproductive success and number of sexual partners in men.

<https://elifesciences.org/digests/65031/does-male-dimorphism-matter>

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### PAPERS

#### **LINDA H LIDBORG, CATHARINE PENELOPE CROSS & LYNDIA G BOOTHROYD – A meta-analysis of the association between male dimorphism and fitness outcomes in humans**

Humans are sexually dimorphic: men and women differ in body build and composition, craniofacial structure, and voice pitch, likely mediated in part by developmental testosterone. Sexual selection hypotheses posit that, ancestrally, more 'masculine' men may have acquired more mates and/or sired more viable offspring. Thus far, however, evidence for either association is unclear. Here, we meta-analyze the relationships between six masculine traits and mating/reproductive outcomes (96 studies, 474 effects, N = 177,044). Voice pitch, height, and testosterone all predicted mating; however, strength/muscularity was the strongest and only consistent predictor of both mating and reproduction. Facial masculinity and digit ratios did not significantly predict either. There was no clear evidence for any effects of masculinity on offspring viability. Our findings support arguments that strength/muscularity may be sexually selected in humans, but cast doubt regarding selection for

other forms of masculinity and highlight the need to increase tests of evolutionary hypotheses outside of industrialized populations.

<https://elifesciences.org/articles/65031>

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## Evolutionary Anthropology

### PAPERS

#### **ROBERT BOYD & PETER J. RICHERSON – Large-scale cooperation in small-scale foraging societies**

We present evidence that people in small-scale mobile hunter-gatherer societies cooperated in large numbers to produce collective goods. Foragers engaged in large-scale communal hunts and constructed shared capital facilities; they made shared investments in improving the local environment; and they participated in warfare, formed enduring alliances, and established trading networks. Large-scale collective action often played a crucial role in subsistence. The provision of public goods involved the cooperation of many individuals, so each person made only a small contribution. This evidence suggests that large-scale cooperation occurred in the Pleistocene societies that encompass most of human evolutionary history, and therefore it is unlikely that large-scale cooperation in Holocene food producing societies results from an evolved psychology shaped only in small-group interactions. Instead, large-scale human cooperation needs to be explained as an adaptation, likely rooted in distinctive features of human biology, grammatical language, increased cognitive ability, and cumulative cultural adaptation.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21944>

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## Frontiers in Communication

### PAPERS

#### **RICHARD FUTRELL & MICHAEL HAHN – Information Theory as a Bridge Between Language Function and Language Form**

Formal and functional theories of language seem disparate, because formal theories answer the question of what a language is, while functional theories answer the question of what functions it serves. We argue that information theory provides a bridge between these two approaches, via a principle of minimization of complexity under constraints. Synthesizing recent work, we show how information-theoretic characterizations of functional complexity lead directly to mathematical descriptions of the forms of possible languages, in terms of solutions to constrained optimization problems. We show how certain linguistic descriptive formalisms can be recovered as solutions to such problems. Furthermore, we argue that information theory lets us define complexity in a way which has minimal dependence on the choice of theory or descriptive formalism. We illustrate this principle using recently-obtained results on universals of word and morpheme order.

<https://www.frontiersin.org/articles/10.3389/fcomm.2022.657725/full>

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#### **WENDY SANDLER – Redefining Multimodality**

The term “multimodality” incorporates visible gestures as part of language, a goal first put forward by Adam Kendon, and this idea revolutionized the scope of linguistic inquiry. But here I show that the term “multimodality” itself is rife with ambiguity, sometimes referring to different physical channels of transmission (auditory vs. visual), and sometimes referring to the integration of linguistic structures with more imagistic, less conventionalized expressions (see David McNeill's work), regardless of the physical channel. In sign languages, both modes are conveyed in a single, visual channel, revealed here in the signing of actors in a sign language theatre. In spoken languages, contrary to expectations raised by defining “modality” in terms of the physical channel, we see that the channel of transmission is orthogonal to linguistic and gestural modes of expression: Some visual signals are part and parcel of linguistic structure, while some auditory (intonational) signals have characteristics of the gestural mode. In this empirical, qualitative study, I adopt the term “mode” to refer solely to specific characteristics of communicative expression, and not to the physical channel. “Multimodal” refers to the coexistence of linguistic and gestural modes, regardless of the physical channel of transmission—straightforwardly encompassing the two natural language systems, spoken and signed.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.758993/full>

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## Frontiers in Psychology

### PAPERS

#### **SÓNIA FROTA et al – Early Word Segmentation Behind the Mask**

Infants have been shown to rely both on auditory and visual cues when processing speech. We investigated the impact of COVID-related changes, in particular of face masks, in early word segmentation abilities. Following up on our previous study demonstrating that, by 4 months, infants already segmented targets presented auditorily at utterance-edge position, and, using the same visual familiarization paradigm, 7–9-month-old infants performed an auditory and an audiovisual word segmentation experiment in two conditions: without and with an FFP2 face mask. Analysis of acoustic and visual cues showed changes in face-masked speech affecting the amount, weight, and location of cues. Utterance-edge position displayed more salient cues than utterance-medial position, but the cues were attenuated in face-masked speech. Results revealed no evidence for segmentation, not even at edge position, regardless of mask condition and auditory or visual speech presentation. However, in the audiovisual experiment, infants attended more to the screen during the test trials

when familiarized with without mask speech. Also, the infants attended more to the mouth and less to the eyes in without mask than with mask. In addition, evidence for an advantage of the utterance-edge position in emerging segmentation abilities was found. Thus, audiovisual information provided some support to developing word segmentation. We compared 7–9-monthers segmentation ability observed in the Butler and Frota pre-COVID study with the current auditory without mask data. Mean looking time for edge was significantly higher than unfamiliar in the pre-COVID study only. Measures of cognitive and language development obtained with the CSBS scales showed that the infants of the current study scored significantly lower than the same-age infants from the CSBS (pre-COVID) normative data. Our results suggest an overall effect of the pandemic on early segmentation abilities and language development, calling for longitudinal studies to determine how development proceeds.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.879123/full>

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## Nature

### NEWS

#### **Ancient tooth suggests Denisovans ventured far beyond Siberia**

Molar found in Laos could be the first fossil evidence that the hominin species was far-ranging and able to adapt to different climates.

<https://www.nature.com/articles/d41586-022-01372-0>

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## Nature Communications

### PAPERS

#### **FABRICE DEMETER et mul with MIKE W. MORLEY, JEAN-JACQUES HUBLIN & ESKE WILLERSLEV – A Middle Pleistocene Denisovan molar from the Annamite Chain of northern Laos**

The Pleistocene presence of the genus *Homo* in continental Southeast Asia is primarily evidenced by a sparse stone tool record and rare human remains. Here we report a Middle Pleistocene hominin specimen from Laos, with the discovery of a molar from the Tam Ngu Hao 2 (Cobra Cave) limestone cave in the Annamite Mountains. The age of the fossil-bearing breccia ranges between 164–131 kyr, based on the Bayesian modelling of luminescence dating of the sedimentary matrix from which it was recovered, U-series dating of an overlying flowstone, and U-series–ESR dating of associated faunal teeth. Analyses of the internal structure of the molar in tandem with palaeoproteomic analyses of the enamel indicate that the tooth derives from a young, likely female, *Homo* individual. The close morphological affinities with the Xiahe specimen from China indicate that they belong to the same taxon and that Tam Ngu Hao 2 most likely represents a Denisovan.

<https://www.nature.com/articles/s41467-022-29923-z>

#### **CÉDRIC GIRARD-BUTTOZ et al with ANGELA D. FRIEDERICI, ROMAN M. WITTIG & CATHERINE CROCKFORD – Chimpanzees produce diverse vocal sequences with ordered and recombinatorial properties**

The origins of human language remains a major question in evolutionary science. Unique to human language is the capacity to flexibly recombine a limited sound set into words and hierarchical sequences, generating endlessly new sentences. In contrast, sequence production of other animals appears limited, stunting meaning generation potential. However, studies have rarely quantified flexibility and structure of vocal sequence production across the whole repertoire. Here, we used such an approach to examine the structure of vocal sequences in chimpanzees, known to combine calls used singly into longer sequences. Focusing on the structure of vocal sequences, we analysed 4826 recordings of 46 wild adult chimpanzees from Tai National Park. Chimpanzees produced 390 unique vocal sequences. Most vocal units emitted singly were also emitted in two-unit sequences (bigrams), which in turn were embedded into three-unit sequences (trigrams). Bigrams showed positional and transitional regularities within trigrams with certain bigrams predictably occurring in either head or tail positions in trigrams, and predictably co-occurring with specific other units. From a purely structural perspective, the capacity to organize single units into structured sequences offers a versatile system potentially suitable for expansive meaning generation. Further research must show to what extent these structural sequences signal predictable meanings.

<https://www.nature.com/articles/s42003-022-03350-8>

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## Nature Scientific Reports

### PAPERS

#### **FRITZ GÜNTHER & LUCA RINALDI – Language statistics as a window into mental representations**

Large-scale linguistic data is nowadays available in abundance. Using this source of data, previous research has identified redundancies between the statistical structure of natural language and properties of the (physical) world we live in. For example, it has been shown that we can gauge city sizes by analyzing their respective word frequencies in corpora. However, since natural language is always produced by human speakers, we point out that such redundancies can only come about indirectly and should necessarily be restricted cases where human representations largely retain characteristics of the physical world. To demonstrate this, we examine the statistical occurrence of words referring to body parts in very different languages, covering nearly 4 billions of native speakers. This is because the convergence between language and physical properties of the stimuli clearly breaks down for the human body (i.e., more relevant and functional body parts are not necessarily larger in size). Our findings indicate that the human body as extracted from language does not retain its actual

physical proportions; instead, it resembles the distorted human-like figure known as the sensory homunculus, whose form depicts the amount of cortical area dedicated to sensorimotor functions of each body part (and, thus, their relative functional relevance). This demonstrates that the surface-level statistical structure of language opens a window into how humans represent the world they live in, rather than into the world itself.

<https://www.nature.com/articles/s41598-022-12027-5>

### **FEDERICO LUGLI et al – Tracing the mobility of a Late Epigravettian (~ 13 ka) male infant from Grotte di Pradis (Northeastern Italian Prealps) at high-temporal resolution**

We present the results of a multi-disciplinary investigation on a deciduous human tooth (Pradis 1), recently recovered from the Epigravettian layers of the Grotte di Pradis archaeological site (Northeastern Italian Prealps). Pradis 1 is an exfoliated deciduous molar (Rdm2), lost during life by an 11–12-year-old child. A direct radiocarbon date provided an age of 13,088–12,897 cal BP (95% probability, IntCal20). Amelogenin peptides extracted from tooth enamel and analysed through LC–MS/MS indicate that Pradis 1 likely belonged to a male. Time-resolved 87Sr/86Sr analyses by laser ablation mass spectrometry (LA-MC-ICPMS), combined with dental histology, were able to resolve his movements during the first year of life (i.e. the enamel mineralization interval). Specifically, the Sr isotope ratio of the tooth enamel differs from the local baseline value, suggesting that the child likely spent his first year of life far from Grotte di Pradis. Sr isotopes are also suggestive of a cyclical/seasonal mobility pattern exploited by the Epigravettian human group. The exploitation of Grotte di Pradis on a seasonal, i.e. summer, basis is also indicated by the faunal spectra. Indeed, the nearly 100% occurrence of marmot remains in the entire archaeozoological collection indicates the use of Pradis as a specialized marmot hunting or butchering site. This work represents the first direct assessment of sub-annual movements observed in an Epigravettian hunter-gatherer group from Northern Italy.

<https://www.nature.com/articles/s41598-022-12193-6>

### **SHEINA LEW-LEVY et al – Socioecology shapes child and adolescent time allocation in twelve hunter-gatherer and mixed-subsistence forager societies**

A key issue distinguishing prominent evolutionary models of human life history is whether prolonged childhood evolved to facilitate learning in a skill- and strength-intensive foraging niche requiring high levels of cooperation. Considering the diversity of environments humans inhabit, children's activities should also reflect local social and ecological opportunities and constraints. To better understand our species' developmental plasticity, the present paper compiled a time allocation dataset for children and adolescents from twelve hunter-gatherer and mixed-subsistence forager societies (n = 690; 3–18 years; 52% girls). We investigated how environmental factors, local ecological risk, and men and women's relative energetic contributions were associated with cross-cultural variation in child and adolescent time allocation to childcare, food production, domestic work, and play. Annual precipitation, annual mean temperature, and net primary productivity were not strongly associated with child and adolescent activity budgets. Increased risk of encounters with dangerous animals and dehydration negatively predicted time allocation to childcare and domestic work, but not food production. Gender differences in child and adolescent activity budgets were stronger in societies where men made greater direct contributions to food production than women. We interpret these findings as suggesting that children and their caregivers adjust their activities to facilitate the early acquisition of knowledge which helps children safely cooperate with adults in a range of social and ecological environments. These findings compel us to consider how childhood may have also evolved to facilitate flexible participation in productive activities in early life.

<https://www.nature.com/articles/s41598-022-12217-1>

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## PLoS One

### PAPERS

#### **CATIA CORREIA-CAEIRO et al – CalliFACS: The common marmoset Facial Action Coding System**

Facial expressions are subtle cues, central for communication and conveying emotions in mammals. Traditionally, facial expressions have been classified as a whole (e.g. happy, angry, bared-teeth), due to automatic face processing in the human brain, i.e., humans categorise emotions globally, but are not aware of subtle or isolated cues such as an eyebrow raise. Moreover, the same facial configuration (e.g. lip corners pulled backwards exposing teeth) can convey widely different information depending on the species (e.g. humans: happiness; chimpanzees: fear). The Facial Action Coding System (FACS) is considered the gold standard for investigating human facial behaviour and avoids subjective interpretations of meaning by objectively measuring independent movements linked to facial muscles, called Action Units (AUs). Following a similar methodology, we developed the CalliFACS for the common marmoset. First, we determined the facial muscular plan of the common marmoset by examining dissections from the literature. Second, we recorded common marmosets in a variety of contexts (e.g. grooming, feeding, play, human interaction, veterinary procedures), and selected clips from online databases (e.g. YouTube) to identify their facial movements. Individual facial movements were classified according to appearance changes produced by the corresponding underlying musculature. A diverse repertoire of 33 facial movements was identified in the common marmoset (15 Action Units, 15 Action Descriptors and 3 Ear Action Descriptors). Although we observed a reduced range of facial movement when compared to the HumanFACS, the common marmoset's range of facial movements was larger than predicted according to their socio-ecology and facial morphology, which indicates their importance for social interactions. CalliFACS is a scientific tool to measure facial movements, and thus, allows us to better understand the common

marmoset's expressions and communication. As common marmosets have become increasingly popular laboratory animal models, from neuroscience to cognition, CalliFACS can be used as an important tool to evaluate their welfare, particularly in captivity.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0266442>

### **ARMANDO FALCUCCI & MARCO PERESANI – The contribution of integrated 3D model analysis to Protoaurignacian stone tool design**

Protoaurignacian foragers relied heavily on the production and use of bladelets. Techno-typological studies of these implements have provided insights into crucial aspects of cultural variability. However, new technologies have seldom been used to quantify patterns of stone tool design. Taking advantage of a new scanning protocol and open-source software, we conduct the first 3D analysis of a Protoaurignacian assemblage, focusing on the selection and modification of blades and bladelets. We study a large dataset of complete blanks and retouched tools from the early Protoaurignacian assemblage at Fumane Cave in northeastern Italy. Our main goal is to validate and refine previous techno-typological considerations employing a 3D geometric morphometrics approach complemented by 2D analysis of cross-section outlines and computation of retouch angle. The encouraging results show the merits of the proposed integrated approach and confirm that bladelets were the main focus of stone knapping at the site. Among modified bladelets, various retouching techniques were applied to achieve specific shape objectives. We suggest that the variability observed among retouched bladelets relates to the design of multi-part artifacts that need to be further explored via renewed experimental and functional studies.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0268539>

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## Science Advances

### PAPERS

#### **HYEOKMOON KWEON et al – Human brain anatomy reflects separable genetic and environmental components of socioeconomic status**

Socioeconomic status (SES) correlates with brain structure, a relation of interest given the long-observed relations of SES to cognitive abilities and health. Yet, major questions remain open, in particular, the pattern of causality that underlies this relation. In an unprecedentedly large study, here, we assess genetic and environmental contributions to SES differences in neuroanatomy. We first establish robust SES–gray matter relations across a number of brain regions, cortical and subcortical. These regional correlates are parsed into predominantly genetic factors and those potentially due to the environment. We show that genetic effects are stronger in some areas (prefrontal cortex, insula) than others. In areas showing less genetic effect (cerebellum, lateral temporal), environmental factors are likely to be influential. Our results imply a complex interplay of genetic and environmental factors that influence the SES-brain relation and may eventually provide insights relevant to policy.

<https://www.science.org/doi/full/10.1126/sciadv.abm2923>

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## Trends in Cognitive Sciences

### PAPERS

#### **MANDEEP K. DHAMI & DAVID R. MANDEL – Communicating uncertainty using words and numbers**

Life in an increasingly information-rich but highly uncertain world calls for an effective means of communicating uncertainty to a range of audiences. Senders prefer to convey uncertainty using verbal (e.g., likely) rather than numeric (e.g., 75% chance) probabilities, even in consequential domains, such as climate science. However, verbal probabilities can convey something other than uncertainty, and senders may exploit this. For instance, senders can maintain credibility after making erroneous predictions. While verbal probabilities afford ease of expression, they can be easily misunderstood, and the potential for miscommunication is not effectively mitigated by assigning (imprecise) numeric probabilities to words. When making consequential decisions, recipients prefer (precise) numeric probabilities.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00060-2](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00060-2)

#### **ISOBEL A. HECK, KRISTIN SHUTTS & KATHERINE D. KINZLER – Children's thinking about group-based social hierarchies**

Wealth, power, and status are distributed unevenly across social groups. A surge of recent research reveals that people begin recognizing, representing, and reasoning about group-based patterns of inequity during the first years of life. We first synthesize recent research on what children learn about group-based social hierarchies as well as how this learning occurs. We then discuss how children not only learn about societal structures but become active participants in them. Studying the origins and development of children's thoughts and behavior regarding group-based social hierarchies provides valuable insight into how systems of inequity are perpetuated across generations and how intergroup biases related to wealth, power, and status may be mitigated and reshaped early in development.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00088-2](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00088-2)

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## Trends in Ecology and Evolution

### PAPERS

#### **EVE DAVIDIAN et al – The eco-evolutionary landscape of power relationships between males and females**

In animal societies, control over resources and reproduction is often biased towards one sex. Yet, the ecological and evolutionary underpinnings of male–female power asymmetries remain poorly understood. We outline a comprehensive framework to quantify and predict the dynamics of male–female power relationships within and across mammalian species. We show that male–female power relationships are more nuanced and flexible than previously acknowledged. We then propose that enhanced reproductive control over when and with whom to mate predicts social empowerment across ecological and evolutionary contexts. The framework explains distinct pathways to sex-biased power: coercion and male-biased dimorphism constitute a co-evolutionary highway to male power, whereas female power emerges through multiple physiological, morphological, behavioural, and socioecological pathways.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(22\)00087-8](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(22)00087-8)

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